Amendments to the Drawings:

Attached are six (6) sheets of drawings that include changes to the designation of each sheet of Figure 1. These sheets, now labeled "Figure 1A" through "Figure 1F", replace the original six sheets collectively labeled "Figure 1".

Remarks

Claim 30 is canceled without prejudice or disclaimer. Claims 24, 28, 31, 34, 35, and 39 are amended and Claim 40 added without prejudice to more clearly define that which the inventors consider their invention. Support for the amendment to Claims 24 and 39 can be found in the specification on page 2, lines 5–19. Support for new Claim 40 can be found in the specification on page 2, lines 12-19, page 7, lines 3–6; page 12, lines 2–4; and page 15, lines 13–38. No new matter is added.

The coding region corresponds to nucleotides 1–1602 of SEQ ID NO:31 which encode the amino acid sequence of SEQ ID NO:32 and nucleotides 1603–1605 form a stop codon.

New drawings containing the corrected figure designations, e.g., "Figure 1A", are attached. The brief description of the figures has been amended to reflect these changes. A typographical error on page 22 is corrected.

Claims 24, 26-28, 30-35 and 37-39 were rejected under 35 USC §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. It was stated on page 3 of the Office Action that the term "Mlo homolog" is unclear because it is not clear what does Mlo activity encompass.

The claims were amended to recite that a disease resistance mediating Mlo polypeptide. The term "Mlo homolog" has been deleted.

Accordingly, withdrawal of the rejection of the claims under 35 USC §112, second paragraph, is respectfully requested in view of the above discussion and amendment.

Claims 24, 26-28, 30-35 and 37-39 were rejected under 35 USC § 101 on the ground that "the claimed invention is not supported by either a substantial asserted utility or a well established utility."

The claims have been amended to recite a disease resistance mediating Mlo polypeptide. This is believed to render moot the rejection of claims to "Mlo homologs" as lacking a clear function. It is stated on page 2 of the specification at lines 5–19 that the "partial or complete inactivation of Mlo results in the priming of the disease-resistance response even in the absence of the pathogen, and leads to increased resistance to *E. graminis*."

It is stated on page 5 of the Office Action that "Applicant does not teach how protein expression or how the claimed polynucleotides should be used to achieve disease resistance."

Attention is kindly invited to page 2 of the specification at lines 12-19 which states that:

> The available scientific data concerning Mlo-mediated disease resistance in barley points towards another approach to controlling disease: priming the pathogen response pathway by diminishing the effectiveness of negative regulation of the hypersensitive response. Appropriately engineered plants may show increased pathogen resistance at the expense of expressing some pathogen response-related genes even in the absence of pathogen. Sense or antisense inhibition or targeted gene disruption of Mlo and Mlo-related genes may have such an effect. Resistance to other pathogens may also be increased using this approach.

Submitted herewith is a copy of Nature, Vol. 404, pages 804-808 (April 20, 2000) which concerns post-transcriptional gene silencing (PTGS). The article states in column 2 on page 804 that PTGS is thought to be an ancient self-defense mechanism evolved to combat infection by viruses and transposons - parasitic stretches of DNA that can hop into an organism's genome, sometimes disrupting important genes. It goes on to discuss Jorgensens's work with co-suppression in the third column of page 804 through column 1 on page 805. Specifically Jorgensen was trying to deepen the hues of flowers. The thinking was that by increasing or overexpressing the activity of the gene for chalcone synthase the color of the flower could be enhanced. What was discovered is that the "revved-up" chalcone synthase muted both itself and the normal flower gene. Jorgenson's work in co-suppression is more fully discussed in U.S. Patent No. 5, 231,020 (copy enclosed).

The '020 patent states in column 8 at lines 1-14 and in column 10 at lines 40-46 that the "homology between the inserted gene and the endogenous gene need not be absolutely identical. Foreign homologous genes would also be subject to this same repression phenomenon. As stated, the repressive effect can occur with many different genes. . . ." Indeed, it is stated in column 7 at lines 39-43 that "the effect may occur where the introduced sequence contains no coding sequence per se, but only intron or untranslated sequences substantially homologous to sequences present in the primary transcript of the endogenous sequence."

Column 8 at lines 1-4 of the '020 patent states further that the "introduced sequence, needing less than absolute homology, also need not be full length, relative to either the primary transcription product of fully processed mRNA. A higher homology in a shorter than full length sequence compensates for a longer less homologous sequence." Thus, even though a full length sequence can used to cosuppress it is not necessary to achieve the desired effect.

In other words, the desired effect can be achieved whether or not a full length sequence is used and whether or not there is some sequence variation. Sense or antisense inhibition or targeted gene disruption of Mlo genes in a plant is believed to trigger increased disease resistance. Accordingly, it is respectfully submitted that the claimed polynucleotides have a real-world use and, thus, possess substantial utility.

Withdrawal of the rejection of the claims under 35 USC §101 is respectfully requested in view of the above discussion and references.

Claims 24, 26-28, 30-35 and 37-39 were also rejected under 35 USC §112, first paragraph, as not being supported by a substantial asserted utility or well-established utility. It is respectfully submitted that the above discussion is equally apposite to this ground of rejection. Accordingly, withdrawal of the rejection of the claims under 35 USC §101 is also respectfully requested in view of the above discussion and references.

Claims 24, 26-28, 30-35 and 37-39 were rejected under 35 USC §112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. It is stated on page 7 of the Office Action that "there is insufficient relevant identifying characteristics to allow one skilled in the art to predictably determine such mutants, allelic variants and other Mlo homologs absent further guidance."

Attention is kindly invited to Büschges *et al.*, *Cell* (1997) 88:695-705 (previously submitted, copy enclosed for examiner's convenience) which discloses six distinctive Mlo transmembrane-spanning domains, a nuclear localization signal (K-K-K-V-R-D) and two copies of the conserved casein kinase II motif (S/T-X-X-D/E). These characteristics were essentially confirmed by Devoto et al. (*J. Mol. Evol.* 56:77-88 (2003); copy enclosed), who analyzed phylogenetically diverse plants and found that while overall Mlo amino acid sequence homology was 70% or less, seven transmembrane domains could be identified in all Mlo family members. Submitted

herewith in Appendix A is a comparison of the claimed sequence with the barley sequence disclosed by Buschges. This comparison demonstrates the sequence of the invention possesses these distinctive, highly conserved, Mlo regions.

Thus, it is respectfully submitted that the written description requirement has been met and withdrawal of the claims under this ground of rejection is respectfully requested.

It is respectfully submitted that the claims are now in form for allowance which allowance is respectfully requested.

A petition for a three (3) month extension of time accompanies this response along with Correction of Inventorship and a Supplemental Information Disclosure Statement.

Please charge any fees or credit any overpayment of fees which are required in connection with the filing of this Response, Petition of Extension of Time and a Supplemental IDS to Deposit Account No.: 04-1928 (E. I. du Pont de Nemours and Company).

Respectfully submitted,

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